

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 16 DEC 2005

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Applicant's or agent's file reference E-2386/04		FOR FURTHER ACTION		See Form PCT/IPEA416
International application No. PCT/EP2004/052222		International filing date (day/month/year) 17.09.2004	Priority date (day/month/year) 19.09.2003	
International Patent Classification (IPC) or national classification and IPC F02M31/20, F28F1/02, F28D1/047				
Applicant DAYCO FUEL MANAGEMENT S.P.A. et al				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 1 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (Indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand 18.07.2005		Date of completion of this report 19.12.2005		
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer von Arx, H Telephone No. +31 70 340-4607		



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International application No.
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Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-4 as originally filed

Claims, Numbers

8 as originally filed
1-7 filed with telefax on 18.07.2005

Drawings, Sheets

1/1 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☒ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☒ the claims, Nos. 8
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing *(specify)*:
 - ☐ any table(s) related to sequence listing *(specify)*:
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing *(specify)*:
 - ☐ any table(s) related to sequence listing *(specify)*:

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-7
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-7
Industrial applicability (IA)	Yes: Claims	1-7
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

1. Reference is made to the following documents:

D1: DE 197 02 440 A (BEHR GMBH & CO) 30 July 1998 (1998-07-30)

D2: GB 569 000 A (EDWARD FRANK SPANNER) 30 April 1945 (1945-04-30)

2. Claim 1 does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The claim attempts to define the subject-matter with negative limitations. Claiming technical features which are not there makes the claim unclear and vague. Therefore the disclaimer "said cooling device does not comprise a radiating plate connected in a direct thermal exchange manner to said pipe" is considered as not being part of claim 1 and will not be discussed.

3. Document D1 discloses (the references in parenthesis applying to this document):
a cooling device for a fuel recirculation circuit from the injection system to the tank of a motor vehicle, comprising a pipe(3) designed to be transversed by the fuel comprising a side wall.

4.1 INDEPENDENT CLAIM 1

- 4.1.1 Document D1, which is considered to represent the most relevant state of the art, discloses a device from which the subject-matter of independent claim 1 differs in that:
the side wall has at least one internal projection obtained by plastic deformation of said side wall.
- 4.1.2 The problem to be solved by the present invention may therefore be regarded as:
how to produce a cooling device with an high heat transfer efficiency.
- 4.1.3 In view of D2 the solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons:
document D2 describes an heat exchange apparatus comprising a pipe having a side wall, said side wall has at least one internal projection, obtained by plastic deformation of said side wall, for securing a greater heat transfer per unit of tube surface.
- 4.1.4 Therefore the features disclosed in D1 and D2 would be combined by the skilled

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person, without exercise of any inventive skills in order to solve the problem posed. The proposed solution in independent claim 1 thus cannot be considered inventive (Article 33(3) PCT).

5 DEPENDENT CLAIMS 2-7

Dependent claims 2-7 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step (Article 33(2) and (3) PCT) because the features of claims 2-8 are known from the combination of D1 and D2.

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C L A I M S

1. A cooling device (1) for a fuel-recirculation circuit from the injection system to the tank of a motor vehicle, comprising a pipe (2) designed to be traversed by the fuel and comprising a side wall (5), characterized in that said side wall (5) has at least one internal projection (7) obtained by plastic deformation of said side wall (5) and in that said cooling device (1) does not comprise a radiating plate connected in a direct thermal exchange manner to said pipe (2).
2. The cooling device according to Claim 1, characterized in that said pipe (2) is coiled.
3. The cooling device according to Claim 2, characterized in that said coiled pipe (2) comprises an alternating succession of elbows (3) and rectilinear stretches (4).
4. The cooling device according to Claim 2 or Claim 3, characterized in that it comprises a plurality of said projections (7).
5. The cooling device according to Claim 4, characterized in that said projections (7) are made on said rectilinear stretches (4).
6. The cooling device according to any one of the preceding claims, characterized in that said projection or projections (7) extend longitudinally.
7. The cooling device according to any one of the preceding claims, characterized in that said side wall (5) is entirely surrounded with a cooling current of air.